Weekly Report

May 13th, 2018

Done:

1. Finish the assignments of writing workshop. Spend much time reading all these papers.
2. Now the area selecting functionality is extended to polygon/multiline/rectangle area selection. The interaction and visual effect is close to mapbox.gl-draw library's implementation.
3. All the descriptive data is crawled now, lots of longitude/latitude is missing yet. I cross check it with the fire-perimeter database, and more integrated version of data will be available next work. Some other issues: lat/lon discrepancy, fire under different complexes, fires merged in one area.
   To analyse the data, I'll first query them all from db. Derive the attributes of burned area, duration, compare with descriptive data.
   Then do some statistics of them, like the distribution of size; how many fires have complete attributes.
4. Take a close look at the visual recommendation for network navigation paper. Several interesting points:
   (1) about top-down or bottom-up approach. I think both of them is needed in our scenario
   (2) the recommendation method is designed to recommend based on two aspects: user interaction history and node relationship. However, the first one is not reflected in the paper, that's why Prof. Ma said it lacks a user study.
   (3) the implicit edges in this paper can be extended.
   (4) although they mentioned ontology graph, the case also doesn't reflect this. In the fire data, there are many attributes, however I'm not sure if these attributes are sufficient to construct ontology relations.

To Do:

1. A preliminary analysis of descriptive data based on the steps mentioned above.
2. Read some paper on graph exploration (as Fangzhou has presented several papers). One big problem is still how to construct the graph. Besides the way use graphiti method (VIS 17), a potential way is we construct a simple one, let users to refine/or refine based on user interaction.
3. Go on integrating all these subcomponents to the system.

Paper reading:

Writing Workshop assignment:

(1) Many visualization and interaction designs require user experiments to evaluate the effectiveness. When the design space is very large and perceptually connected, crowdsourcing is a good option for its lower cost, time and good ecological validity[1]. Heer and Bostock[1] are the first to use Mechanical Turk to investigate crowdsourced experiments for graphical perception research. Their results show that crowdsourcing is viable for experiments in

graphical perception, and make recommendations on ways to achieve better experiment qualities. Matejka et al.[2] also employ crowdsourcing to study the effect of visual appearance on the performance of continuous sliders and visual analogue scales (VASs). Two separate studies are conducted with various conditions, which results in a large design space. Hence crowdsourcing is applicable in this scenario. Similarly, Szafir[3] models color difference perception for three common mark types (points, bars and lines) with different parameter settings, which leads to a bunch of combinations. Crowdsourcing is also utilized to conduct these experiments.

[1] Heer, J., & Bostock, M. (2010, April). Crowdsourcing graphical perception: using mechanical turk to assess visualization design. In Proceedings of the SIGCHI conference on human factors in computing systems (pp. 203-212)
[2] Matejka, J., Glueck, M., Grossman, T., & Fitzmaurice, G. (2016, May). The effect of visual appearance on the performance of continuous sliders and visual analogue scales. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 5421-5432)
[3] Szafir, D. A. (2018). Modeling Color Difference for Visualization Design. IEEE transactions on visualization and computer graphics, 24(1), 392-401

(2) this paper discuss a broad definition of collaborative visualizations and elaborate with representative examples. It pinpoints a special focus of collaborative visualization despite that collaborative visualization lies at the intersection of traditional visualization and computer-supported cooperative work. Challenges and research agenda are also proposed for future research.

Isenberg, P., Elmqvist, N., Scholtz, J., Cernea, D., Ma, K. L., & Hagen, H. (2011). Collaborative visualization: Definition, challenges, and research agenda. Information Visualization, 10(4), 310-326.